Seek

Volume 3
Issue 1 *Winter*

Article 3

May 2016

Water Quality 101: Professor Aims to Change Discussion of Humanity's Value of Water

Stephanie Jacques
Kansas State University

WATER QUALITY 101:

PROFESSOR AIMS TO CHANGE DISCUSSION OF HUMANITY'S VALUE OF WATER

As water quality issues continue to spring up, so does Walter Dodds' research to solve them.

Recycling, composting and conserving are routine for environmentally conscious people like Walter Dodds, Kansas State University distinguished professor of biology. But Dodds, an ecologist, takes it one step further.

His professional career is dedicated to researching Earth's freshwater systems and encouraging others to take an active role in being eco-friendly. Dodds' research on nitrogen cycling in freshwater systems has been published in such major scientific journals as Nature and Science, and in 2010 he was part of a national research team that discovered that streams and rivers produce three times more greenhouse gas emissions than estimated by the Intergovernmental Panel on Climate Change. As water quality issues continue to spring up, so does his research to solve them.

Developing a better model for determining large-scale water quality

Most recently, Dodds has taken on a $3.3 million National Science Foundation project called Scale, Consumers and Lotic Ecosystem Rates, or SCALER. The project aims to improve freshwater research by creating a more accurate model for determining large-scale information from small-scale studies. Dodds is collaborating with eight universities across North America to determine water quality in different biomes.

"We hope we can figure out a way to do the small-scale sampling to truly capture what's going on with the large scale, because logistically and economically it is easier to conduct small-scale sampling," Dodds said.

Providing baseline data for good water quality

Dodds is heavily involved with Konza Prairie Biological Station — 8,616 acres of tallgrass prairie dedicated to long-term ecological research and jointly owned by Kansas State University and The Nature Conservancy. He uses data gathered from watersheds on Konza Prairie to form baseline data of what a freshwater system without human influence looks like. Because finding an entire watershed unaffected by humans is difficult in a world of 7 billion people, scientists around the world have used data collected on Konza Prairie.

"I am trying to get an idea of what the natural situation was before humans affected the system so I can form a baseline for how freshwater systems respond biologically to nutrients," Dodds said.

Aiding land managers with information about new management techniques

Patch burning is an emerging management technique gaining popularity among ranchers, but its effect on watersheds is unknown. The technique divides the land into three sections on a rotating burn schedule. One section is burned and gets grazed heavily as the cattle prefer the new regrowth in the burned area. The other two sections rest and are much less preferred by cattle. To assist land managers in conserving the whole prairie, Dodds is conducting a patch burn and grazing study on Missouri's Osage Prairie to study the technique's effect on the watershed.

"The patch burn grazing is a way people have proposed to manage the prairie and perhaps put grazers on prairie that is being preserved," Dodds said. "It can clearly increase terrestrial plant and animal diversity, but how that influences watersheds downstream is not well understood."

Speaking out on freshwater management and environmental issues

Dodds' books — "Humanity's Footprint: Momentum, Impact and Our Global Environment," "Freshwater Ecology: Concepts and Environmental Applications of Limnology" and "Laws, Theories and Patterns in Ecology" — have stimulated teaching and discussion about environmental issues. However, recent droughts and building of dams have raised another issue that concerns Dodds: fragmented freshwater systems and their effect on the biota.

"Currently, the discussion is about how much flow makes it down to the Missouri and Mississippi rivers for barge traffic verses how much water to hold in reservoirs so they are high enough for boating," Dodds said. "There isn't much discussion about the effects the fragmentation has on the biota. In times of drought such as this, we have set up a situation where species may go extinct as the stress of low or no flow pushes endangered organisms over the brink."

By Stephanie Jacques, Communications and Marketing